Annexed to the international preliminary examination report

CLAIMS

1. Conjugate comprising a polymeric carrier with a maximum of 100 monomeric units which contains 1 - 10 hapten molecules and 1 - 10 marker or solid phase binding groups coupled to reactive side groups, wherein the monomeric units are selected from nucleotides, nucleotide analogues and peptidic nucleic acids.

2. Conjugate comprising a polymeric carrier with a maximum of 100 monomeric units which contains 1 - 10 hapten molecules and 1 - 10 marker or solid phase binding groups coupled to reactive side groups, wherein the monomeric units are selected from amino acids and the marker groups are selected from luminescent metal chelates.

3. Conjugate as claimed in claim 1 ~~or 2~~,
wherein
the polymeric carrier has a length of 3 - 80 monomeric units.

4. Conjugate as claimed in claim 1 ~~one of the previous claims~~,
wherein
the polymeric carrier has a length of 5 - 60 monomeric units.

5. Conjugate as claimed in claim 1 ~~one of the previous claims~~, **wherein**
it contains 1 - 6 hapten molecules.

6. Conjugate as claimed in claim 1 ~~one of the previous claims~~, **wherein**
it contains 2 - 8 marker or solid phase binding groups.

7. Conjugate as claimed in one of the claims 1 or 3-6, **wherein**
the polymeric carrier comprises a chain composed of nucleotides or/and nucleotide analogues.

8. Conjugate as claimed in one of the claims ~~1 or 3-6~~, **wherein**
the polymeric carrier comprises a chain which is composed of peptidic nucleic acids.

9. Conjugate as claimed in claim 7 ~~or 8~~, **wherein**
the polymeric carrier is present as a double strand.

10. Conjugate as claimed in claim 9, **wherein**
the double strand contains at least one chain which comprises peptidic nucleic acids.

11. Conjugate as claimed in ~~one of the previous claims~~ claim 1, **wherein**
the hapten molecules and marker or solid phase binding groups are coupled to the polymeric carrier via reactive amino or/and thiol side groups.

12. Conjugate as claimed in ~~one of the claims~~ claim 1 or 3-11, **wherein**
it contains marker groups which are selected from luminescent metal chelates or fluorescent groups.

13. Conjugate as claimed in ~~one of the claims 1 to 11~~ claim 1, **wherein**
it contains solid phase binding groups that are selected from biotin or biotin analogues.

14. Conjugate as claimed in claim 2 or 12, **wherein**
the marker groups are luminescent metal chelates and the polymeric carrier contains at least one positive or/and negative charge carrier.

15. Conjugate as claimed in claim 12, **wherein**
the marker groups are fluorescent groups and the polymeric carrier has an essentially helical structure.

16. Conjugate as claimed in claim 1 ~~one of the previous claims~~, **wherein**
the hapten is an immunologically reactive molecule having a molecular mass of 100-2000 Da.

17. Conjugate as claimed in claim 16, **wherein**
the hapten is selected from pharmacologically active substances, hormones, metabolites, vitamins, mediators and neurotransmitters.

18. Conjugate as claimed in claim 1 ~~one of the claims 1 to 15~~, **wherein**
the hapten is selected from immunologically reactive peptide epitopes having a length of up to 30 amino acids.

19. Conjugate as claimed in claim 1 ~~one of the claims 1 to 15~~, **wherein**
the hapten is selected from nucleic acids having a length of up to 50 nucleotides.

20. Conjugate as claimed in claim 1 ~~one of the claims 1 to 15~~, **wherein**
the hapten is selected from peptidic nucleic acids having a length of up to 50 monomeric units.

21. Process for the production of conjugates comprising a polymeric carrier with a maximum of 100 monomeric units which contains 1 - 10 hapten molecules and 1 - 10 marker or solid phase binding groups coupled to reactive side groups, wherein the monomeric

units are selected from nucleotides, nucleotide analogues and peptidic nucleic acids
wherein
a polymeric carrier composed of monomeric units is synthesized on a solid phase in which

(a) during the synthesis monomer derivatives are introduced at predetermined positions on the carrier which are covalently coupled to hapten molecules or/and marker or solid phase binding groups or/and

(b) after the synthesis activated hapten molecules or/and marker or solid phase binding groups are coupled to reactive side groups of the carrier.

22. Process as claimed in claim 21,
wherein
a peptide carrier is synthesized from amino acid derivatives.

23. Process as claimed in claim 21 ~~or 22~~,
wherein
in variant (a) the hapten molecules or/and marker groups or solid phase binding groups are in each case coupled to a primary amino group or a thiol group of the monomer derivative.

24. Process as claimed in claim 21 ~~or 22~~,
wherein
in variant (b) coupling to the amino or/and thiol side groups of the carrier is carried out after

cleaving the protecting groups of the monomer derivatives used for the solid phase synthesis.

25. Process as claimed in claim 21, ~~22 or 24~~, **wherein**
after the synthesis in variant (b) the hapten molecules and marker or solid phase binding groups are coupled to primary amino side groups of the carrier, wherein a monomer derivative with a first protecting group for the amino side group is used at positions of the carrier at which the hapten molecules are to be coupled and a monomer derivative with a second protecting group for the amino side groups is used at positions of the carrier at which marker or solid phase binding groups are to be coupled and the first and the second protecting group are selected in such a way that it is possible to selectively cleave the protecting groups.

26. Process as claimed in claim 25, **wherein**
the first and second protecting group are selected from acid-labile or acid-stable protecting groups.

27. Use of conjugates as claimed in one of the claims 1 to 20 or produced by a process as claimed in one of the claims 21-26 as an antigen in an immunological method or for nucleic acid diagnostics.

28. ~~Use as claimed in claim 27,~~ The method of claim 27, **wherein**
conjugates that contain more than 1 hapten molecule are used as polyhaptens in immunological detection methods.

29. Use as claimed in claim 27 or 28 in a competitive immunoassay.

30. Use as claimed in claim 27 or 28 in an immunoassay for detecting specific antibodies.

31. Method for the detection of an analyte in a sample liquid based on the principle of a competitive immunoassay in a "labelled analogue" format, **wherein**
(a) the sample liquid is incubated in the presence of a reactive solid phase with a conjugate which contains a marker group as claimed in one of the claims 1 to 20 or produced by a process as claimed in one of the claims 21-26 which contains a marker group and with a receptor which is bound to the solid phase or is capable of binding to a solid phase and can enter into a specific immunological reaction with the analyte and the hapten component of the conjugate,
(b) the solid phase is optionally separated from the incubation liquid and
(c) the presence or/and the amount of analyte in the sample liquid is determined by measuring

the marker component of the conjugate in the solid phase or/and in the incubation liquid.

32. Method as claimed in claim 31,
wherein
a biotinylated antibody or a biotinylated antibody fragment is used as a receptor and a solid phase coated with streptavidin or avidin is used.

33. Method for the detection of an analyte in a sample liquid based on the principle of a competitive immunoassay in a "labelled antibody" format,
wherein
(a) the sample liquid is incubated in the presence of a reactive solid phase with a conjugate which carries a solid phase binding group as claimed in claim 1 ~~one of the claims 1 to 20~~ or produced by a process as claimed in one of the claims 21-26 that contains a solid phase binding group and with a receptor which carries a marker group and can enter into a specific immunological reaction with the analyte and the hapten component of the conjugate,
(b) the solid phase is optionally separated from the incubation liquid and
(c) the presence or/and the amount of analyte in the sample liquid is determined by measuring the marker component of the receptor in the solid phase or/and in the incubation liquid.

34. Method as claimed in claim 33,
wherein
a biotinylated conjugate and a solid phase coated with streptavidin or avidin is used.

35. Method for the detection of a specific antibody in a sample liquid,
wherein
(a) the sample liquid is incubated with at least one conjugate as claimed in ~~one of the claims 1 to 20~~ claim 1 or produced by a process as claimed in one of the claims 21-26 which is directed against the antibody to be determined and
(b) the antibody is detected via binding to the conjugate.

36. Method as claimed in claim 35,
wherein
(a) the sample liquid is incubated in the presence of a reactive solid phase and two antigens directed against the antibody to be determined wherein the first antigen carries a marker group and the second antigen is bound to the solid phase or is present in a form capable of binding to the solid phase,
(b) the solid phase is optionally separated from the incubation liquid and
(c) the presence or/and the amount of the antibody is detected by determining the label in the solid phase or/and in the liquid phase,
wherein ~~a~~ the conjugate ~~as claimed in one of the claims 1 to 20~~ claim 1 or produced by a process as claimed in one

of the claims 21-26 is used as the first or/and the second antigen.

37. Method as claimed in claim 36,
wherein
a luminescent metal chelate or a conjugate labelled with a fluorescent group is used as the first antigen.

38. Method as claimed in claim 36 ~~or 37~~,
wherein
a biotinylated conjugate or a solid phase coated with streptavidin or avidin is used as the second antigen.

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